CM75SD2048RLP

2048 MB DDR Server Memory Module

Key Features

- 184-pin, dual in-line memory module (DIMM)
- Power supply: Vdd: 2.6V +/- 0.1V, Vddq: 2.5V +/- 0.2V (PC2100 / PC2700); 2.6V +/- 0.1V (PC3200)
- Double-data-rate architecture; two data transfers per clock cycle
- Bidirectional data strobe (DQS)
- Differential clock inputs (CK and CK)
- DLL aligns DQ and DQS transition with CK transition
- Programmable Read latency 2, 2.5 (clock)
- Programmable Burst length (2, 4, 8)
- Programmable Burst type (sequential & interleave)
- Edge aligned data output, center aligned data input
- Auto & Self refresh, 7.8us refresh interval (8K/64ms refresh)
- Serial presence detect with EEPROM
- Low Profile form factor, ideal for 1U rack mount servers

Selection Guide

CM75SD2048RLP-xxxx/x

MODULE SIZE:
2048 MByte

SPEED:
2100: PC2100 (266MHz)
2700: PC2700 (333MHz)
3200: PC3200 (400MHz)

RAM VENDOR:
M = Micron
N = Infineon
S= Samsung

General Description

The CM75SD2048RLP is a Synchronous Dynamic RAM Dual Inline Memory Module (DIMM), designed for applications in which both performance and density are critical. The low 1.2 inch maximum height of this module makes it ideally suited for use in 1U rackmount servers and appliances. This DIMM includes Error Checking and Correcting (ECC) for maximum reliability, and has registered address and control signals to enable fully configured systems.

These modules are constructed using thirty-six 128Mx4 SDRAMs in FBGA packages. The module also includes an EEPROM to support Serial Presence Detect (SPD) requirements. Decoupling capacitors are mounted on the printed circuit board for each SDRAM device.

The synchronous design of these Corsair SDRAM DIMMs allows precise cycle control with the use of the system clock. I/O transactions are possible on every clock cycle. The high clock frequency and high density of this device enable a high level of performance to be achieved in advanced workstations and servers.

Pin Definitions

Pin Name	Function	Pin Name	Function
A0 ~ A12	Address input (Multiplexed)	DM0 ~ DM8	Data - in mask
BA0 ~ BA1	Bank Select Address	VDD	Power supply (2.5V)
DQ0 ~ DQ63	Data input/output	VDDQ	Power Supply for DQS(2.5V)
DQS0 ~ DQS17	Data Strobe input/output	VSS	Ground
CK0,$\overline{CK0}$ ~ CK2, $\overline{CK2}$	Clock input	VREF	Power supply for reference
CKE0, CKE1(for double banks)	Clock enable input	VDDSPD	Serial EEPROM Power/Supply (2.3V to 3.6V)
$\overline{CS0}$, $\overline{CS1}$(for double banks)	Chip select input	SDA	Serial data I/O
$\overline{RAS}$	Row address strobe	SCL	Serial clock
$\overline{CAS}$	Column address strobe	SA0 ~ 2	Address in EEPROM
$\overline{WE}$	Write enable	NC	No connection
CB0 ~ CB7	Check bit(Data-in/data-out)		

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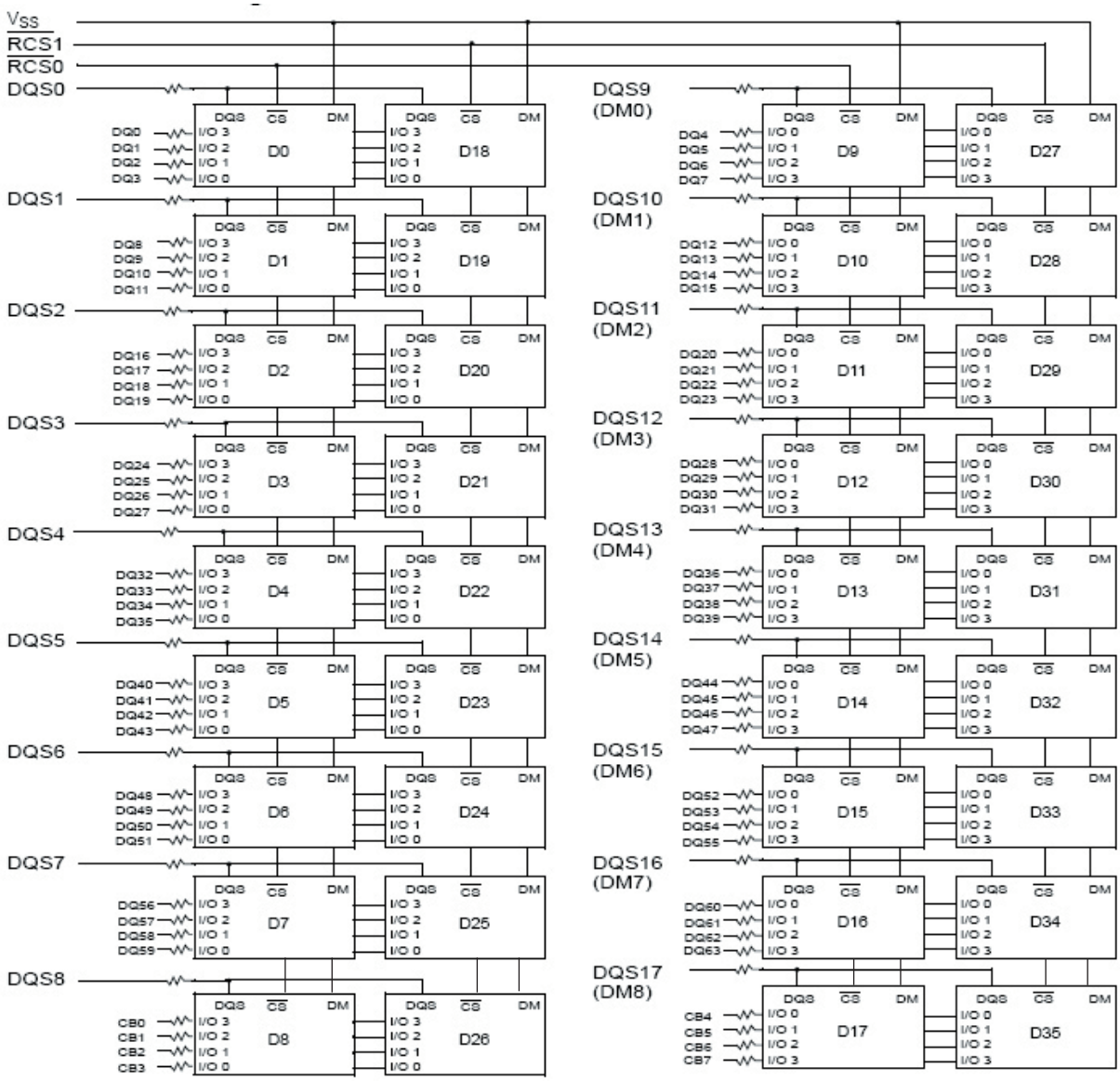
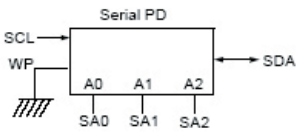
Pin Configuration

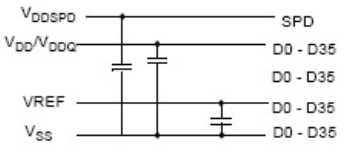
Pin	Front	Pin	Front	Pin	Front	Pin	Back	Pin	Back	Pin	Back
1	VREF	32	A5	62	VDDQ	93	VSS	124	VSS	154	/RAS
2	DQ0	33	DQ24	63	/WE	94	DQ4	125	A6	155	DQ45
3	VSS	34	VSS	64	DQ41	95	DQ5	126	DQ28	156	VDDQ
4	DQ1	35	DQ25	65	/CAS	96	VDDQ	127	DQ29	157	/CS0
5	DQS0	36	DQS3	66	VSS	97	DM0/DQS9	128	VDDQ	158	/CS1
6	DQ2	37	A4	67	DQS5	98	DQ6	129	DM3/DQS12	159	DM5/DQS14
7	VDD	38	VDD	68	DQ42	99	DQ7	130	A3	160	VSS
8	DQ3	39	DQ26	69	DQ43	100	VSS	131	DQ30	161	DQ46
9	NC	40	DQ27	70	VDD	101	NC	132	VSS	162	DQ47
10	/RESET	41	A2	71	*/CS2	102	NC	133	DQ31	163	*/CS3
11	VSS	42	VSS	72	DQ48	103	NC	134	CB4	164	VDDQ
12	DQ8	43	A1	73	DQ49	104	VDDQ	135	CB5	165	DQ52
13	DQ9	44	CB0	74	VSS	105	DQ12	136	VDDQ	166	DQ53
14	DQS1	45	CB1	75	*CK2	106	DQ13	137	CK0	167	*A13
15	VDDQ	46	VDD	76	*/CK2	107	DM1/DQS10	138	/CK0	168	VDD
16	*CK1	47	DQS8	77	VDDQ	108	VDD	139	VSS	169	DM6/DQS15
17	*/CK1	48	A0	78	DQS6	109	DQ14	140	DM8/DQS17	170	DQ54
18	VSS	49	CB2	79	DQ50	110	DQ15	141	A10	171	DQ55
19	DQ10	50	VSS	80	DQ51	111	CKE1	142	CB6	172	VDDQ
20	DQ11	51	CB3	81	VSS	112	VDDQ	143	VDDQ	173	NC
21	CKE0	52	BA1	82	VDDID	113	*BA2	144	CB7	174	DQ60
22	VDDQ	KEY		83	DQ56	114	DQ20	KEY		175	DQ61
23	DQ16	53	DQ32	84	DQ57	115	A12	145	VSS	176	VSS
24	DQ17	54	VDDQ	85	VDD	116	VSS	146	DQ36	177	DM7/DQS16
25	DQS2	55	DQ33	86	DQS7	117	DQ21	147	DQ37	178	DQ62
26	VSS	56	DQS4	87	DQ58	118	A11	148	VDD	179	DQ63
27	A9	57	DQ34	88	DQ59	119	DM2/DQS11	149	DM4/DQS13	180	VDDQ
28	DQ18	58	VSS	89	VSS	120	VDD	150	DQ38	181	SA0
29	A7	59	BA0	90	NC	121	DQ22	151	DQ39	182	SA1
30	VDDQ	60	DQ35	91	SDA	122	A8	152	VSS	183	SA2
31	DQ19	61	DQ40	92	SCL	123	DQ23	153	DQ44	184	VDDSPD

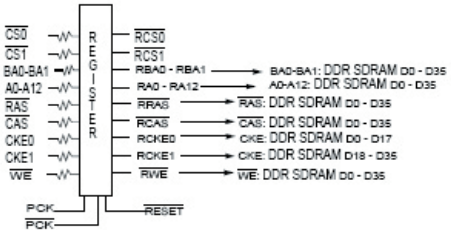
* NC for this module.

Functional Block Diagram









CK0,CK0 → PLL*

* Wire per Clock Loading table/wiring Diagrams

Notes:
1. DQ-to-I/O wiring is shown as recommended but may be changed.
2. DQ/DQS/DM/CKE/CS relationships must be maintained as shown.
3. DQ, DQS, DM/DQS resistors: 22 Ohms.

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DC Electrical Specifications

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Voltage on any pin relative to Vss	V_{IN}, V_{OUT}	-0.5 ~ 3.6	V
Voltage on V_{DD} supply relative to Vss	V_{DD},V_{DDQ}	-1.0 ~ 3.6	V
Storage temperature	T_{STG}	-55 ~ +150	°C
Power dissipation	P_D	1.5 * # of component	W
Short circuit current	I_{OS}	50	mA

Note : Permanent device damage may occur if ABSOLUTE MAXIMUM RATINGS are exceeded.
Functional operation should be restricted to recommended operating condition.
Exposure to higher than recommended voltage for extended periods of time could affect device reliability.

Power & DC Operating Conditions (SSTL_2 In/Out)

Recommended operating conditions (Voltage referenced to V_{SS}=0V, T_A=0 to 70°C)

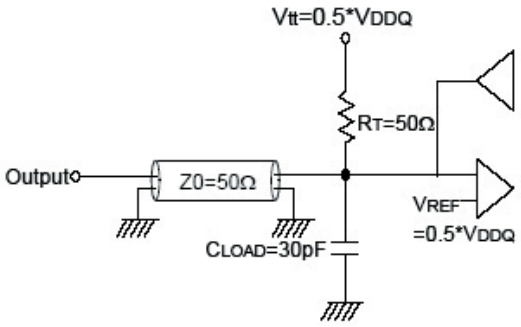
Parameter	Symbol	Min	Max	Unit	Note
Supply voltage(for device with a nominal V_{DD} of 2.5V)	V_{DD}	2.3	2.7	V	1
I/O Supply voltage	V_{DDQ}	2.3	2.7	V	1
Supply voltage(for device with a nominal V_{DD} of 2.5V)	V_{DD}	2.5	2.7	V	2
I/O Supply voltage	V_{DDQ}	2.5	2.7	V	2
I/O Reference voltage	V_{REF}	VDDQ/2-50mV	VDDQ/2+50mV	V	
I/O Termination voltage(system)	V_{TT}	V_{REF}-0.04	V_{REF}+0.04	V	
Input logic high voltage	V_{IH}(DC)	V_{REF}+0.15	V_{DDQ}+0.3	V	
Input logic low voltage	V_{IL}(DC)	-0.3	V_{REF}-0.15	V	
Input Voltage Level, CK and $\overline{CK}$ inputs	V_{IN}(DC)	-0.3	V_{DDQ}+0.3	V	
Input Differential Voltage, CK and $\overline{CK}$ inputs	V_{ID}(DC)	0.3	V_{DDQ}+0.6	V	
Input leakage current	I_I	-2	2	uA	
Output leakage current	I_{OZ}	-5	5	uA	
Output High Current(Normal strength driver) ;V_{OUT} = V_{TT} + 0.84V	I_{OH}	-16.8		mA	
Output High Current(Normal strength driver) ;V_{OUT} = V_{TT} - 0.84V	I_{OL}	16.8		mA	
Output High Current(Half strength driver) ;V_{OUT} = V_{TT} + 0.45V	I_{OH}	-9		mA	
Output High Current(Half strength driver) ;V_{OUT} = V_{TT} - 0.45V	I_{OL}	9		mA	

Notes: 1 values for PC2100, PC2700
2 values for PC3200

AC Operating Conditions

Parameter/Condition	Symbol	Min	Max	Unit	Note
Input High (Logic 1) Voltage, DQ, DQS and DM signals	VIH(AC)	VREF + 0.31		V	3
Input Low (Logic 0) Voltage, DQ, DQS and DM signals.	VIL(AC)		VREF - 0.31	V	3
Input Differential Voltage, CK and CK inputs	VID(AC)	0.7	VDDQ+0.6	V	1
Input Crossing Point Voltage, CK and CK inputs	VIX(AC)	0.5*VDDQ-0.2	0.5*VDDQ+0.2	V	2

Note : 1. VID is the magnitude of the difference between the input level on CK and the input on $\overline{CK}$.
2. The value of V_{IX} is expected to equal $0.5*V_{DDQ}$ of the transmitting device and must track variations in the DC level of the same.
3. These parameters should be tested at the pim on actual components and may be checked at either the pin or the pad in simulation. the AC and DC input specifications are in relation to a Vref envelope that has been bandwidth limited 20MHz.



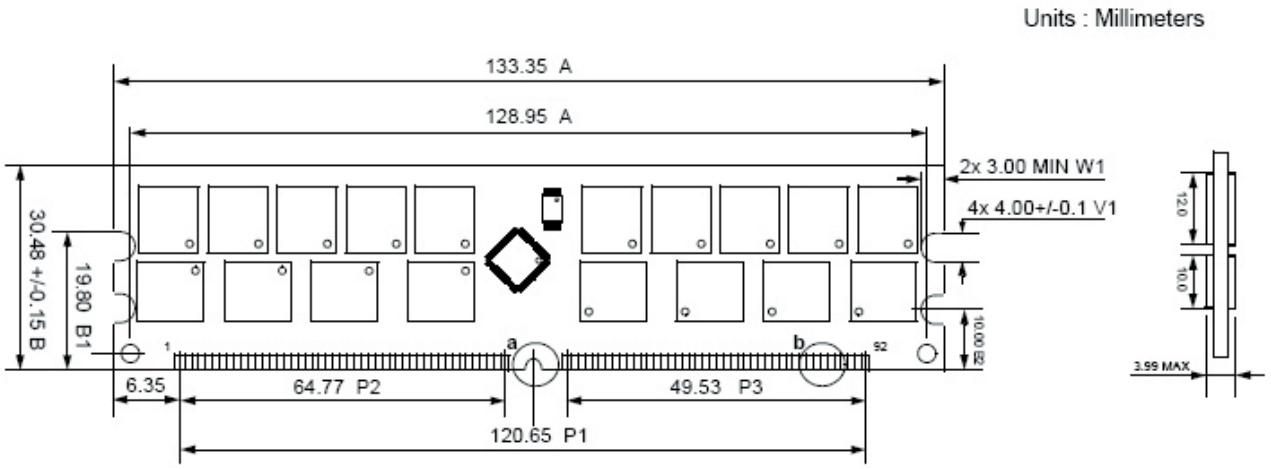
Output Load Circuit (SSTL_2)

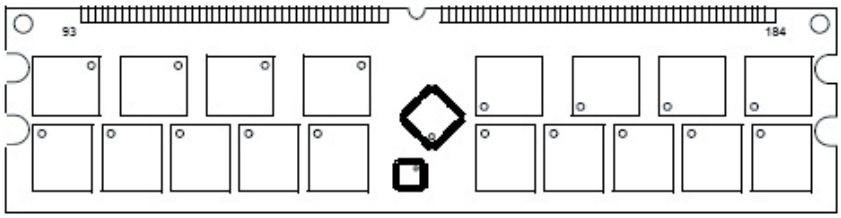
Input/Output Capacitance

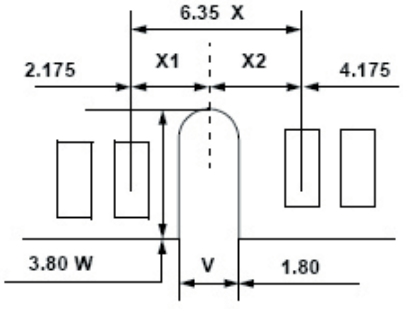
(VDD=2.5V, VDDQ=2.5V, TA= 25°C, f=1MHz)

Parameter	Symbol	M312L2920BG0		Unit
		Min	Max	
Input capacitance(A0 ~ A12, BA0 ~ BA1,$\overline{RAS}$,$\overline{CAS}$,$\overline{WE}$)	CIN1	9	11	pF
Input capacitance(CKE0)	CIN2	9	11	pF
Input capacitance($\overline{CS0}$)	CIN3	9	11	pF
Input capacitance(CLK0, $\overline{CLK0}$)	CIN4	11	12	pF
Input capacitance(DM0~DM8)	CIN5	10	15	pF
Data & DQS input/output capacitance(DQ0~DQ63)	Cout1	10	15	pF
Data input/output capacitance (CB0~CB7)	Cout2	10	15	pF

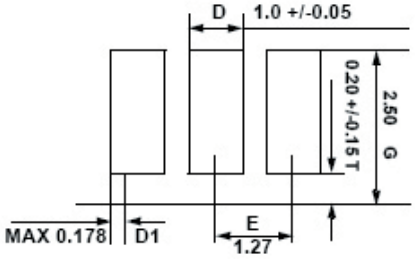
Package Configuration







Detail A



Detail B

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